RECONNOISSANCE SOIL SURVEY OF TATTNALL COUNTY GEORGIA.

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INTRODUCTION.

In the summer of 1912 the soils of Tattnall County, Ga., were examined in a general way for the purpose of issuing a preliminary report upon the character, general distribution, and cropping capabilities of the more important types. Such reconnoissance work is intended to bring out only the more important characteristics of the dominant soil types, and the information contained herein is based upon preliminary data secured from various points in the county. It is planned to make a detailed soil survey of the county at a later date and to issue a complete report covering more fully the agricultural value of the soil, and showing upon an accurate map the exact location of all bodies of soil occurring in the county. The soil descriptions in this report, with the sketch map (fig. 14), are intended to afford needed information pending the issuance of the more complete report.

DESCRIPTION OF THE AREA.

Tattnall County is situated in eastern Georgia. Its county seat, Reidsville, is about 60 miles almost due west from Savannah. It is bounded on the northwest by Emanuel County, on the northeast by Bulloch,[1] on the southeast by Liberty, on the southwest by Appling and Wayne, and on the west by Toombs County. The Canoochee and Altamaha Rivers, respectively, form the northeastern and southwestern boundaries, while the Ohoopee River follows the western boundary from the northwestern corner of the county to several miles south of Collins, where it swings eastward and then southward into the county, finally joining the Altamaha a considerable distance east of the southwestern corner of the county.

The surface of the county, excepting the "flatwoods" section in the central part, with smaller scattered areas of similar character, is sufficiently rolling or high to afford good regional drainage. The topography of the well-drained soils varies from flat or gently undulating to gently rolling, and is favorable to agriculture. The general

[1] See Soil Survey of Bulloch County, Ga., Bureau of Soils, U. S. Dept. of Agriculture.

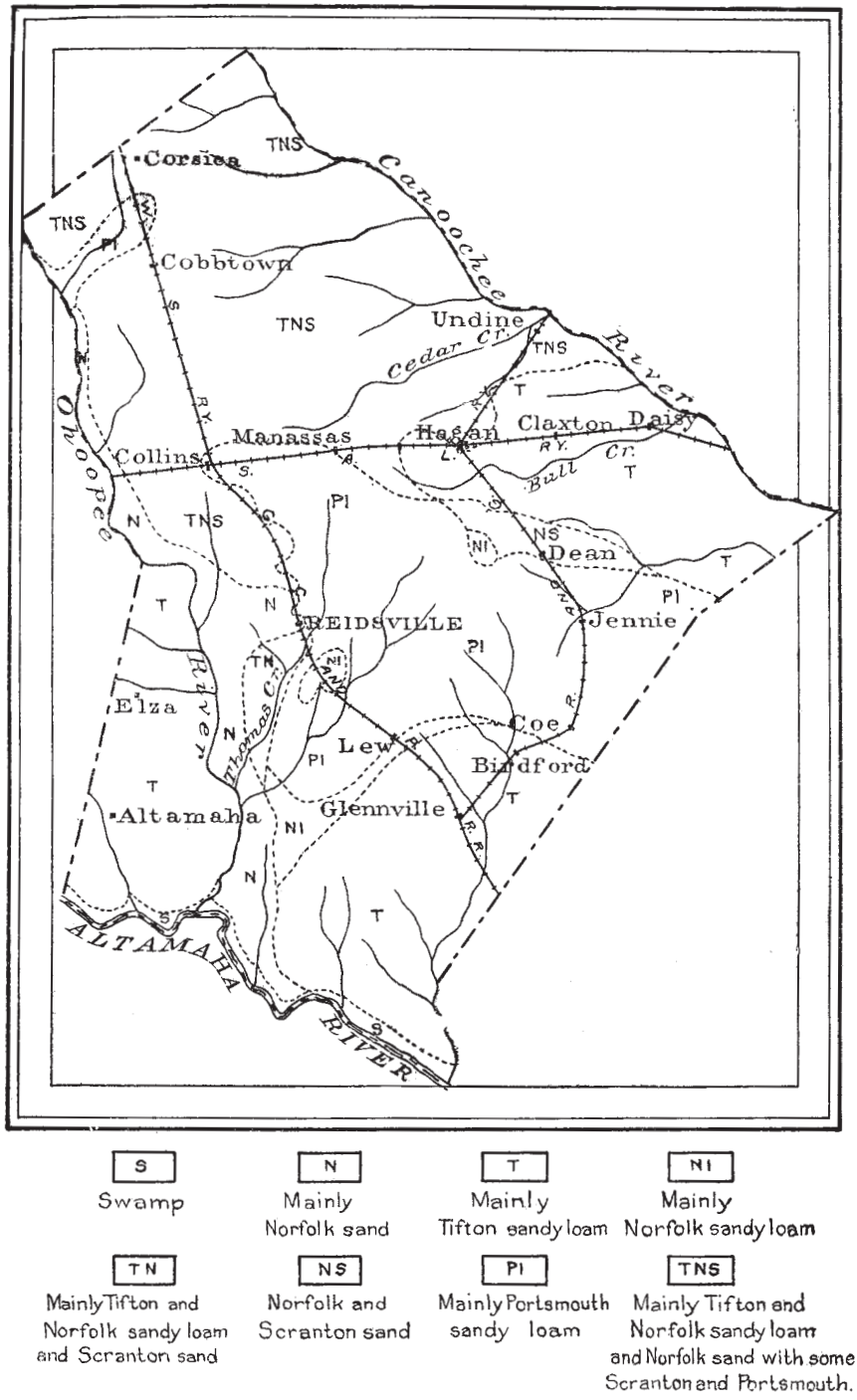

FIG. 14.—Sketch map of Tattnall County, Ga., showing approximately the general distribution of main soil types.

lay of the land and the open nature of the soil material permit good surface and subsurface drainage without causing injurious erosion. Even though drainage is often excessive, the soils practically nowhere show evidences of serious washing. Creeks with wide-reaching laterals and sublaterals traverse the more rolling part of the county, and but few areas of any considerable size are without drainage outlets.

The "flatwoods section," south of the Seaboard Air Line Railway, and smaller isolated areas are subject to different conditions. Their surface is flat and nearly level and the drainage ways are shallow and infrequent. Consequently the water remains on the surface for some length of time after rains, most of it disappearing through percolation and evaporation. The soils are often saturated for weeks after periods of wet weather and are, therefore, in their natural state unsuited to agriculture.

Tattnall County embraces an area of about 642 square miles, or 410,880 acres. A large proportion of this land is available for agriculture, probably 40 to 50 per cent now being under cultivation. With ditching all of the land can be farmed except the stream bottoms, and even they may be reclaimed to agriculture by ditching and deepening and straightening the stream channels. The entire county was originally forested, principally with longleaf pine and scrubby oak on the uplands, and bay, magnolia, slash pine, swamp maple, tupelo, and titi in the bottoms. A great part of the merchantable pine has been cut.

CLIMATE.

The climate of Tattnall County is characterized by long summers, with a temperature frequently varying between 90° and 95° F. and occasionally rising to about 100° F., and short, mild winters, with rare snow flurries and frequent light frosts and freezes. The summer temperature is modified by breezes from the Atlantic Ocean and the Gulf of Mexico. Crops are rarely injured and never destroyed by hot summer winds. A number of crops, such as cabbage, beets, turnips, and collards, can be successfully grown in the open throughout the winter, while even tenderer vegetables can be grown with only light covering during the coldest spells.

The rainfall is sufficient for all needs and is generally properly distributed for the continued growth of plants. Dry spells or unusually wet seasons sometimes injure crops.

The table following shows the monthly and annual means of precipitation and temperature for the Savannah station of the Weather Bureau, located about 60 miles east of the area.

Normal monthly, seasonal, and annual temperature and precipitation at Savannah.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	°F.	°F.	°F.	Inches.	Inches.	Inches.
December	52	80	12	3.2	1.0	5.5
January	51	80	12	3.1	3.6	6.4
February	54	84	8	3.3	4.2	3.1
Winter	52	.....	.....	9.6	8.8	15.0
March	59	88	24	3.7	2.3	3.1
April	66	90	33	3.3	1.9	1.1
May	74	101	44	2.8	2.7	4.0
Spring	66	.....	.....	9.8	6.9	8.2
June	79	100	50	6.1	6.8	8.1
July	82	105	63	5.8	3.7	7.9
August	81	102	61	7.9	6.4	14.4
Summer	81	.....	.....	19.8	16.9	30.4
September	76	97	46	5.7	2.1	12.0
October	67	92	37	3.7	1.0	7.7
November	58	83	22	2.4	1.0	0.6
Fall	67	.....	.....	11.8	4.1	20.3
Year	66	105	8	51.0	36.7	73.9

AGRICULTURE.

Until a comparatively recent date the chief interests of Tattnall County were centered in the turpentining and lumbering industries, and these are still of importance locally throughout the county. Within the last decade, however, agriculture has steadily advanced, overtaking and passing the turpentine and lumber industries as measured by both the labor employed and the value of products. Lumbering in this region is only incidental to the preparation of land for farming purposes, although it has not always been purposely so. On the better drained soils, such as the Tifton and Norfolk, the cutting of the pine has left little to do preliminary to putting the land in crops, the general practice having been to cultivate without removing the stumps, or even the few standing trees in many cases.

The use of land for agriculture has often succeeded the production of turpentine and resin where operators of the distilleries have turned their endeavors to farming, as the turpentine orchards were encroached upon by woodcutters and sawmills or abandoned by reason of the diminishing returns incident to long use of the trees.

The present utilization of the better drained cut-over lands represents the first step in the agricultural development of the county. A second step will follow the reclamation of the large area now too poorly drained for profitable cultivation. Further advance will result from the adoption of more modern methods of farming.

The important crops of Tattnall County are long-staple and short-staple cotton, corn, velvet beans, oats, peanuts, sugar-cane, sweet potatoes, watermelons, and cowpeas. Cotton is the most important money crop, the others being grown more for home use and local markets than for export. All of these can be profitably grown for market or for use in raising stock, particularly hogs, for market. Many early vegetables give splendid results, as will be pointed out in the detailed discussion of the various soil types given further on.

In this preliminary report no attempt is made to outline in detail the methods of farming practiced or to enter into a full discussion of the improvement of such methods. These points are referred to in the descriptions of the important soils which follow, where also the crop adaptations of the various soils are brought out.

The practice of crop rotation receives little attention. This is largely due to the fact that cotton, the most important crop of the county, can be grown continuously for long periods in the same field without causing any marked decline in the productiveness of the soil. Crop diversification is becoming more popular, however, particularly in growing velvet beans, cowpeas, and peanuts with or between other crops.

The failure to use fertilizers or their improper use accounts for some depreciation in productiveness of the land. Experience has demonstrated that the use of barnyard manure or other fertilizers is essential to continued good yields in this area. Since enough manure to meet the requirements of the soils is not likely to be made and since successful farming must include fertilization, more attention must be given to the proper application of fertilizers to meet the requirements of individual soils or crops. The homemade mixtures are recommended, and their use should depend on actual field experiments by individual farmers, or, preferably, by trained men, on carefully selected experiment fields including the different soils. Among mixtures used on all soils, the farmer frequently not even knowing the analysis of the brand used, are those having the following formulas: 8–2–2 (8 per cent phosphoric acid, 2 per cent nitrogen, and 2 per cent potash), 8–2–3, 9–2–2, 9–2–3, 10–2–2, 10–3–4, and 10–4–4. The acreage application generally ranges from about 300 to 400 pounds for cotton. Over a wide area of Coastal Plain country, including soils similar to those of Tattnall County, the results of such applications indicate in general that the deep, sandy soils need a

relatively higher percentage of potash, more nitrogen, and less phosphoric acid than soils of a heavier texture or having clay nearer the surface. Less nitrogen is needed where cowpeas and velvet beans are included in the rotations, and lighter applications will suffice and give better results where the soil contains a good supply of vegetable matter from whatever source.

Generally the methods of preparing the land and cultivating crops are very good. Improvement in many cases would result from deeper fall plowing of those areas where clay is near the surface, followed by a winter cover crop, and from shallow cultivation at more frequent intervals during dry seasons in order to conserve moisture. Stumps should be worked out so as to increase the efficiency of the farm equipment used in cultivating the land. The winter season affords plenty of time to make headway in digging, blasting, and burning out stumps.

The value of land has advanced remarkably within the last few years. Much of the Tifton sandy loam is held at $40 to $75 an acre. The Norfolk sandy loam, where the depth to clay is not more than about 15 to 20 inches, is very nearly as valuable as the Tifton. The value of the more poorly drained soils will advance as their worth is brought out in drained fields. At present some of these can be bought in the cut-over condition for as low as $5 an acre.

SOILS.

There are three main soil divisions in Tattnall County: (1) The well-drained uplands; (2) the poorly drained uplands, and (3) the overflowed stream bottom lands.

The well-drained uplands include soils of the Tifton and Norfolk series, the former differing from the latter principally in the presence of a large quantity of iron concretions locally called "pebbles" or "pimples." Both series include types with grayish surface soils and yellow subsoils.

The poorly drained uplands are represented by the Portsmouth, Plummer, and Scranton series. The poor drainage results from the flat surface and inadequate drainage outlets. Water stands for long periods on the surface of large areas, while the subsoil is nearly always saturated. The Portsmouth series includes the black soils having gray or mottled gray and yellow subsoils, while the Plummer soils are gray, with subsoils similar to those of the Portsmouth. The Scranton series comprises those lands having dark-gray or black surface soils, like those of the Portsmouth series, and yellow subsoils like those of the Norfolk. This is an intermediate group of soils, having properties and occupying positions lying between those of the Portsmouth and Norfolk series.

The alluvial soils comprise the frequently overflowed bottom lands, which have been built up by the accumulation of sediments deposited by the streams upon their flood plains. Along the larger streams, like the Altamaha, a considerable proportion of the particles has been transported for long distances, in this case from the Piedmont region to the west. The material of the smaller streams has been derived from the local soils.

The material of the upland soils, which are very largely sandy loam and sand types, represents sediments which were laid down ages ago in the sea that covered this portion (Coastal Plains) of the State. Since the uplift of the land above the ocean the influences of weathering and vegetation have altered the condition of the original deposits, giving rise to the present variety of soils.

TIFTON SANDY LOAM.

The Tifton sandy loam is the most valuable of the extensively developed soils of Tattnall County. Properly handled it gives good yields of a variety of crops, including the ordinary general farm crops and some special crops. It is easy to cultivate, conserves moisture well, and suffers little if at all from erosion. It is one of the most important upland sandy soils of the South, and is developed most extensively in southern Georgia, west of the flatwoods region bordering the Atlantic coast, and in southeastern Alabama. Locally this soil is known as "pimply land," "pebbly land," "rocky land," "gravelly land," "hard land," and "clay land."

The Tifton sandy loam of Tattnall County in its typical development is a gray or light grayish brown loamy sand, underlain at 2 to 5 inches by a brownish-yellow sandy loam, which passes into the subsoil usually at a depth of 8 to 15 inches. The subsoil is a bright-yellow or greenish-yellow, friable sandy clay. Sometimes below 30 inches a faint mottling with reddish yellow occurs. In small areas along the better-drained slopes the lower subsoil color is yellowish red. These areas comprise the situations where good drainage and aeration have caused a more complete oxidation of the material, with consequent reddening of the iron constituents.

The depth to clay varies somewhat, the soil being shallowest ordinarily on the crests of ridges. Frequently the depth of the sandy loam surface portion becomes greater with descent of slope, but some of the slopes comprise areas having a decidedly shallow surface soil throughout. Generally the subsoil lies deeper where the topography is more nearly level. In many places the clay subsoil lies from 20 to 24 inches below the surface. The most important characteristic distinguishing the Tifton sandy loam from the Norfolk sandy loam is the presence in the former of a large amount of small,

roundish iron concretions or pebbles, reddish brown to brownish red in color, scattered over the surface and throughout the soil section. The quantity of these varies, but usually it is sufficient to interfere somewhat with cultivation, sometimes making deep plowing a little more difficult, especially where the ground is well dried out. Most of these pebbles range from about one-eighth to three-fourths of an inch and a few to over an inch in diameter, with a few larger than this. Below 3 feet the yellow sandy clay quickly passes into a substratum of compact or weakly cemented sand and clay, showing in exposures a mottling of bright red, purple, yellow, and white.

The topography is gently rolling. Plate IV, figure 1, illustrates the smooth surface of frequent low, broad ridges sloping gently toward the numerous drainage ways, which are bordered by other soils, generally Swamp. A considerable proportion of the type is flat to gently undulating. In this development the depth to the clay is greater than in the case of the typical soil, and the content of iron pebbles is generally lower. To the west of Glennville there is a considerable area of this smoother phase. Here representative borings showed the soil to consist of a gray sand, underlain at about 3 inches by pale yellow loamy sand, which between 20 and 30 inches grades into a yellow, friable sandy loam to sandy clay. A moderate to fairly large quantity of concretions occurs from the surface downward.

This type is the dominant soil in the section around Birdford and Glennville and southwestward to the Altamaha River bottoms, in that part of the county lying west of the Ohoopee River, and in the vicinity of Claxton and Hogan and southeastward to the county line. It also has an important development in association with the Norfolk sandy loam and Norfolk sand in that part of the county lying to the north of the Seaboard Air Line Railway. Its areas are everywhere interrupted to some extent by other soils, such as the narrow strips of swamp along the streams, the Portsmouth and Scranton soils in the depressions, and the Norfolk sand and sandy loam in the rolling uplands. Topographically it is well suited to tillage operations. The slopes are not steep enough to erode. Drainage is well established, but the moisture-holding capacity of the soil is such that crops are more likely to suffer from an excess of water in wet seasons than from scarcity of water in dry seasons.

With proper management, including particularly deep plowing, frequent shallow cultivation of crops, and moderate applications of commercial fertilizers, cotton yields from three-fourths to 1 bale or more per acre, corn from 25 to 60 bushels or more, oats from 30 to 60 bushels, and cowpeas from 1 to 2 tons of excellent hay per acre. Both long-staple and short-staple cotton are grown.

Peanuts give excellent results, being grown to a considerable extent as a forage crop for hogs. They can be planted in rows, between corn, and cultivated with little additional labor. They add more or less nitrogen and valuable vegetable matter to the soil, their tops can be cut for hay, while the ground is given a beneficial stirring by hogs rooting for the nuts.

Another valuable forage crop is the velvet bean. Large yields are produced, especially where moderately fertilized, affording good field forage for stock and adding a large amount of organic matter and nitrogen to the soil.

Sugar cane, when fertilized, yields from 250 to 400 gallons or more of good sirup per acre. Sorghum does very well. The soil is suited to pecans and to plums, blackberries, and dewberries.

When given applications of 400 to 800 pounds of a fertilizer mixture analyzing about 6 per cent phosphoric acid, 3 or 4 per cent nitrogen, and 4 to 6 per cent potash, or their equivalent of home-mixed fertilizer ingredients such as cottonseed meal, sulphate of potash, or kainit and acid phosphate, the Tifton sandy loam will in average seasons produce in the neighborhood of 1 bale of cotton per acre. Lighter applications are sufficient where the soil is well supplied with vegetable matter, and less nitrogen is required where the legumes have been grown. Corn and oats seem to require about the same mixture as does cotton, but lighter applications are satisfactory. It is believed that the practice of adding a part of the fertilizer about the time of seeding and the remainder as a side application is a good one. An application of 50 to 100 pounds of sodium nitrate several weeks after the plants have started to grow, especially when they show signs of lagging, is advisable for nearly all crops. Sugar cane gives best results with a moderate application of compost and about 800 to 1,000 pounds per acre of a high-grade complete fertilizer mixture.

The legumes, cowpeas, and velvet beans should be grown in rotation with other crops. Occasionally a crop of cowpeas, or even oats or rye, should be turned under green to maintain the supply of organic matter in the soil. It is a good plan to seed overworked fields giving diminished yields to a winter cover crop, such as vetch, oats, or rye, to be plowed under green in the spring.

NORFOLK SANDY LOAM.

The Norfolk sandy loam is another important soil in Tattnall County. While it is not so productive as the Tifton sandy loam, it is capable of producing profitable yields of all the crops suited to that soil.

There are two phases of the type, one with a deep and the other with a relatively shallow surface soil. In color, texture, structure,

and topography the Norfolk sandy loam closely resembles the Tifton sandy loam, but it is practically free of the ferruginous concretions or pebbles which mark the Tifton, and its subsoil does not seem to contain quite so much clay.

The deep or flat phase, as developed to the south of Manassas, to the north and west of Glennville, near Deane, and in other parts of the county, usually consists of a gray sand underlain at about 3 inches by pale-yellow loamy sand, which extends to a depth of something like 24 to 30 inches, where a yellow, friable sandy loam to sandy clay is encountered. To the south of the Seaboard Air Line Railroad several areas of the flat Norfolk sandy loam occur in close association with the Portsmouth sandy loam. They stand only a few feet above the latter soil and are almost indistinguishable from it at a distance. Generally the Norfolk and Portsmouth types are separated by a narrow strip of Scranton sandy loam.

North of the Seaboard Air Line Railroad there is a rather large total area of the typical or shallow phase of the type, occurring mainly in association with the Tifton sandy loam and Norfolk sand. Here the soil varies somewhat in depth, but generally the clay subsoil is nearer the surface than in the flat areas of the type and the land is more generally rolling or gently rolling. A typical boring shows the soil to consist of a gray sand, passing into pale-yellow loamy sand at about 3 to 5 inches, and this in turn into yellow, friable sandy loam, usually at from 12 to 24 inches. The sandy subsoil gradually becomes heavier with increasing depth until friable yellow sandy clay is reached in the lower part of the 3-foot section. Small quartz gravel is found in many places in both phases of the type.

The topography of the Norfolk sandy loam varies from flat to gently rolling. Surface and under drainage are good. The soil conserves moisture in amounts sufficient for the ordinary needs of crops, particularly in those areas where clay is nearer the surface. The type supports a growth of longleaf pine with some blackjack oak. Wire grass is everywhere abundant, while a wild legume sometimes called "devil's shoestring" is quite common.

A considerable proportion of the type is under cultivation to cotton, corn, cowpeas, and in a smaller way it is used for velvet beans, oats, sugar cane, sweet potatoes, and peanuts. For good yields a rather liberal use of fertilizers is necessary. With an acreage application of 600 to 1,000 pounds of a mixture analyzing about 6 per cent phosphoric acid, 4 per cent nitrogen, and 6 per cent potash this land should produce at least a bale of cotton per acre, and from 40 to 60 bushels of corn. Lighter applications of the same fertilizer should give a yield of 40 to 60 bushels of oats and 300 bushels or more of sweet potatoes per acre. Other crops that do well are Irish potatoes, cantaloupes, cucumbers, watermelons, cabbage, snap beans, radishes, garden peas,

FIG. 1.—CHARACTERISTIC SMOOTH SURFACE OF THE TIFTON SANDY LOAM.

[The crest of a ridge south of Claxton.]

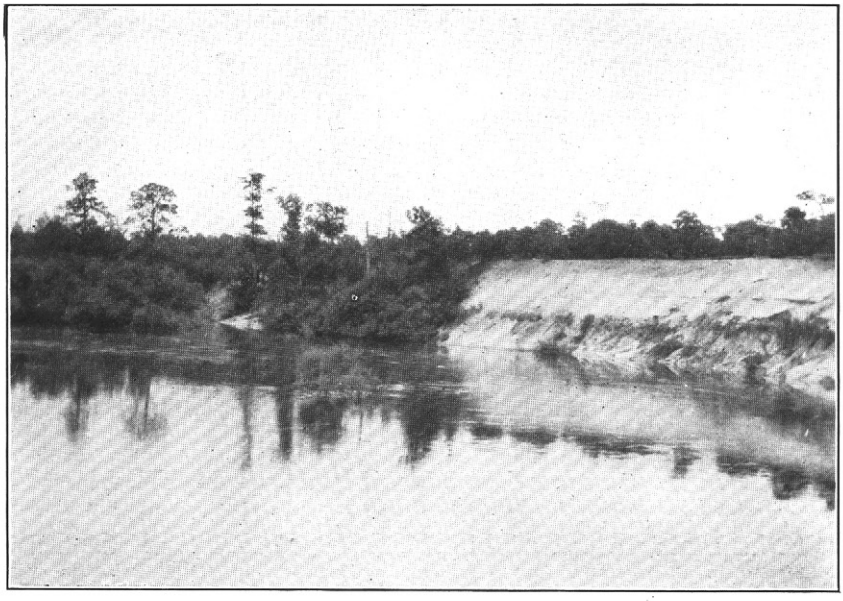

FIG. 2.—SAND BLUFF ON EAST SIDE OF OHOOPEE RIVER WEST OF GLENNVILLE.

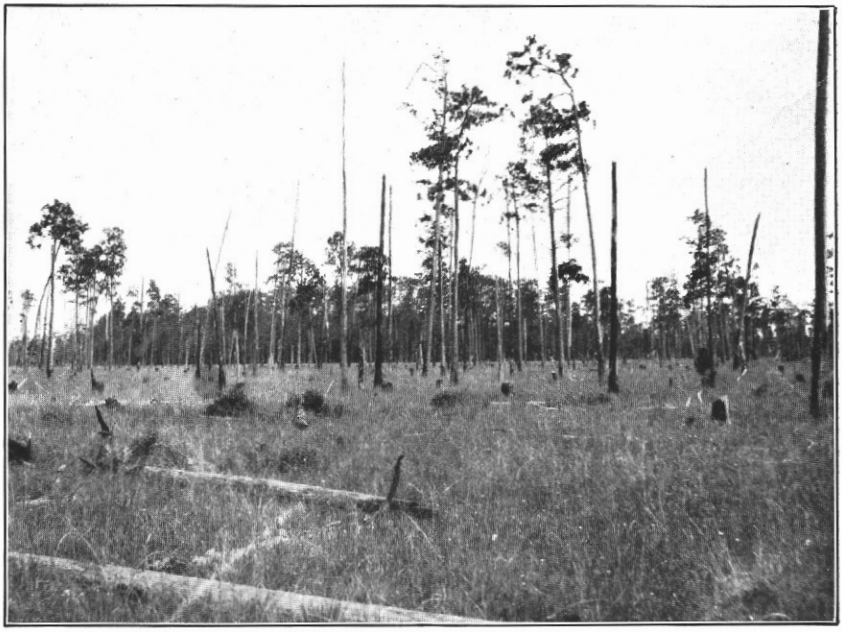

FIG. 1.—CUT-OVER PINE LAND EAST OF REIDSVILLE, SHOWING IN THE BACKGROUND A TYPICAL DENSE GROWTH OF CYPRESS IN ONE OF THE SMALL, SHALLOW DEPRESSIONS COMMON TO THE PORTSMOUTH SANDY LOAM.

FIG. 2.—CHARACTERISTIC GROWTH OF LONGLEAF (YELLOW) PINE, "BOXED" FOR TURPENTINE, ON SCRANTON SANDY LOAM, NEAR LEW.

and asparagus. All of these require heavy fertilization with barnyard manure or complete mixtures carrying relatively high percentages of potash and nitrogen.

The legumes, such as cowpeas, velvet beans, and beggarweed, should be included regularly in rotations with other crops to add vegetable matter to the soil and to reduce the quantity of nitrogen now purchased at a high price in the commercial mixtures. Occasionally a crop of cowpeas should be plowed under in order to keep the soil in good condition. In dry seasons crops sometimes develop prematurely, particularly in those fields where the clay lies at considerable depths, while in wet seasons they are easier to handle than on the poorer drained lands. Crops stand drought better, however, on the loose sandy land than on land having clay at or near the surface. This is probably due to the fact that evaporation is more rapid in the heavier soil than in sandy soil, where the material is easily kept in the loose mulch favoring the conservation of moisture. Crops on sandy land like this type suffer during protracted wet seasons generally more than on the clay lands. This was true with cotton during the wet spring of 1912.

NORFOLK SAND.

The Norfolk sand is similar to the surface soil of the Norfolk sandy loam. Typically it consists of a loose gray sand, underlain at 5 to 8 inches by slightly more compact, pale yellow sand.

The type occurs as a long strip from one to several miles wide along the east side of Ohoopee River (see Pl. IV, fig. 2) and as scattered areas of varying size over all parts of the county, except the central and eastern section occupied almost completely by the Portsmouth sandy loam. It is more frequently found along the east than on the west side of streams, the reason for this not being understood. The surface varies from gently rolling or hillocky to flat. Some fairly large areas of the flat land occur in the vicinity of Dean in close association with the Scranton sand and Portsmouth sandy loam, above which it stands from only a few inches to a foot or so. This flat phase, with some slightly depressed areas, has a darker color than that having a more uneven surface configuration. This is caused by the larger organic-matter content resulting from the somewhat poorer drainage, which not only induces a ranker growth of vegetation but also retards its decay. This portion of the type represents an approach toward the condition of the Scranton sand. It is naturally a little more productive than the light-colored phase.

While a considerable part of the Norfolk sand is utilized in the production of general farm crops, such as corn, oats, and cowpeas, by far the larger part is forested with longleaf pine and forkedleaf blackjack oak. Scattered clumps of saw palmetto are conspicuous in places.

Owing to the loose, leachy nature of the soil, it is not retentive of moisture or soluble materials, and commercial fertilizers rapidly disappear. With the small applications of low-grade fertilizers usually made only light yields of cotton, oats, and corn are obtained. For the production of good yields of any crops heavy applications of high-grade complete mixtures are required. By growing the legumes and occasionally plowing under a green crop, fairly good yields may be obtained with moderately heavy applications of fertilizers. From 800 to 1,500 pounds per acre of a 6–4–6 mixture is not too much for watermelons, Irish and sweet potatoes, and a number of other vegetables. With such an application probably three-fourths to 1 bale of cotton can be grown in a year of normal rainfall.

On account of its thorough drainage, the soil warms up early in the spring. It is consequently suited to the production of early vegetables, including snap beans, garden peas, lettuce, tomatoes, Irish potatoes, sweet potatoes, cantaloupes, cucumbers, watermelons, cabbage, beets, okra, and asparagus.

PORTSMOUTH SANDY LOAM.

The Portsmouth sandy loam consists of a dark-gray to black sand having a loamy character owing to the high content of organic matter. This is underlain at about 8 to 12 inches by grayish sand, and at about 18 to 26 inches by mottled gray and pale-yellow loamy sand, grading below into similarly mottled sandy loam. Mottled sandy clay is usually reached between 30 and 40 inches. The soil closely approaches a loamy sand in texture, but the lower subsoil is a little too heavy for the type to be mapped as such. Crawfish holes with chimneys consisting of light colored material brought from below are abundant in places.

The type almost completely occupies a large area in the center of the county, from the vicinity of Collins easterly through Manassas and Dean and southward by Reidsville and Lew. This area extends into the main flatwoods region east of Tattnall County. Other areas of the type are scattered here and there throughout the county in close association with other soils.

The Portsmouth sandy loam is the poorest-drained upland soil in the county. This is the result of its flat surface, combined with the immature nature of the drainage system. Although the surface is very flat and level, there are numerous slight, roundish and irregularly shaped depressions throughout the type which hold water for a considerable part of the year. These depressions support thick growths of cypress (see Pl. V, fig. 1) or mixed cypress and titi or a shrub resembling titi, which mark their location, the dense cypress clumps showing plainly through the sparse pine growth on the dominant soil. Originally the type was forested with longleaf pine, but

much of this has been removed. There are occasional areas of Norfolk and Scranton soils in this type, occupying very slight elevations which are imperceptible at short distances. There are more gallberry bushes on this soil than on the Scranton and Norfolk, but much less wire grass and devil's shoestring. Water stands over the land for long periods following rainy seasons, owing to its flat surface and inadequate drainage outlets. The soil material is practically saturated throughout the year.

Most of the Portsmouth sandy loam is not utilized or is used only for grazing, the merchantable timber having been largely removed. For any kind of utilization extensive ditching will be necessary. A few patches were seen in which cotton and corn were making a poor growth. The cotton (1912 crop) was rusting badly and the corn showed an unhealthy, yellow color, but it is understood that better results are secured in seasons of less rain. The soil is acid and would be improved by applications of burnt lime or ground limestone at the rate of about 1 ton of the former or 2 tons of the latter per acre, as a minimum application.

In addition to drainage, fertilizers are necessary for good results with any crops. Moderate to heavy applications of a brand analyzing about 8–3–4 will suffice for the crops that are likely to give best results, including sugar cane, corn, oats, cotton, cowpeas, velvet beans, and such vegetables as cabbage and Irish potatoes.

SCRANTON SAND AND SANDY LOAM.

Scattering areas of the Scranton sand and sandy loam are encountered here and there throughout the county. These soils are characterized by the dark-gray to black color of the surface portion and the yellow color of the subsoils. The surface soils resemble those of the Portsmouth series, while their subsoils are similar to those of the Norfolk. The type occupies a place, in point of drainage and often in actual location, between the Norfolk and Portsmouth series.

An area of the Scranton sandy loam, with a typical growth of longleaf pine, is shown in Plate V, figure 2. With drainage and fertilization the type produces good yields of corn, cotton, and forage crops. It requires about the same treatment as the Norfolk sandy loam. Crops are a little later than on the Norfolk sandy loam and for this reason it seems that the fertilizers should carry more phosphoric acid than those recommended for the Norfolk soils.

The Scranton sand when ditched will give heavier yields than the Norfolk sand, at least for a time, owing to the fact that it conserves moisture better and has a higher content of organic matter.

Both the sand and sandy loam lose their supply of organic matter under cultivation, unless those rotations are practiced which include humus-supplying crops such as cowpeas and velvet beans.

PLUMMER LOAMY SAND.

A few areas of Plummer loamy sand were seen in the northern part of the county. This type is closely related to the Portsmouth sandy loam, one of the main differences being the lighter color of the Plummer soil. A typical section of the Plummer loamy sand consists of a drab to gray loamy sand, underlain at about 24 to 32 inches by mottled yellow and gray or reddish-yellow and gray sandy loam to sandy clay.

The type is very poorly drained and requires ditching in order to be in proper condition for the production of crops. It occupies slight depressions and flat areas near stream courses and small drainage ways. Pitcher plants and a small unidentified shrub which has a five-petal yellow flower are common plants on the type.

With drainage and fertilization corn and sugar cane will give good results. Applications of lime will prove beneficial.

SWAMP.

The Altamaha River is fringed with broad, heavily forested bottoms which are subject to frequent deep inundation. The soil material is somewhat variable in color, but is fairly uniform in texture, which is probably a silt loam to silty clay loam. This would prove a productive soil if it could be protected from overflow.

Another phase of Swamp occurs in strips of varying size along nearly all the streams of the county. This largely consists of sand and sandy loam carrying a considerable quantity of organic matter. The areas are subject to overflow and remain in a permanently soggy condition. They are timbered with bay, magnolia, tupelo, swamp maple, titi, slash pine, and other water-loving plants.

If reclaimed, limed, and fertilized this land will produce heavy yields of sugar cane and corn.

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